WHAT IS CLAIMED IS:

1. A thin film thickness measurement apparatus comprising:

a light receiving unit directing light substantially perpendicular to a substrate and receiving light reflected from said substrate; and

an analyze unit analyzing thickness of a thin film of said substrate according to intensity of reflected light received by said light receiving unit.

2. The thin film thickness measurement apparatus according to claim 1, wherein said light receiving unit comprises

a light source, and

an optical fiber guiding light from said light source onto said substrate, and receiving reflected light from said substrate to guide the light to said analyze unit.

3. The thin film thickness measurement apparatus according to claim 2, wherein said optical fiber is a branch type optical fiber guiding light from said light source to a plurality of sites on said substrate, and receiving light reflected from said plurality of sites,

said thin film thickness measurement apparatus further comprising a shutter selectively blocking plurality of reflected light received by said branch type optical fiber.

4. The thin film thickness measurement apparatus according to claim 3, said analyze unit including

a spectroscope dividing reflected light from said substrate according to intensity of each wavelength, and

a calculation unit calculating thickness of a thin film of said substrate according to intensity of each wavelength divided by said spectroscope.

5. The thin film thickness measurement apparatus according to claim 4, wherein said calculation unit calculates thickness of said thin film

by equations of:

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2,1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1,0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2, 1) = \rho(2, 1)^2$$

$$R(1, 0) = \rho(1, 0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said thin film.

6. The thin film thickness measurement apparatus according to claim 4, wherein said calculation unit calculates thickness of said thin film by equations of:

$$R(p+1, 0) = \frac{A + B}{1 + C + B}$$

$$A = R(p+1, p) + R(p, 0) \times k^2$$

$$B = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k \times \cos(\gamma(p, 0) + \gamma(p))$$

$$C = R(p+1, p) \times R(p, 0) \times k^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)} \times (1 - \rho(p, p-1)^2) \times \sin(\gamma(p-1, 0) + \gamma(p-1))$$

$$E = \rho(p, p-1) \times (1 + R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0) \times (1 + \rho(p, p-1)^2) \times \cos(\gamma(p-1, 0) + \gamma(p-1))}$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p) / \lambda$$

where n_0 is a refractive index of said substrate, $n(p)$ is a refractive index of the p-th layer of thin film from said substrate, $n(p+1)$ is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said p-th layer of thin film.

7. The thin film thickness measurement apparatus according to claim 2, said analyze unit including

a spectroscope to divide reflected light from said substrate according to intensity of each wavelength, and

a calculation unit calculating thickness of a thin film of said substrate according to intensity of each wavelength divided by said spectroscope.

8. The thin film thickness measurement apparatus according to claim 7, wherein said calculation unit calculates thickness of said thin film by equations of:

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2, 1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1, 0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2, 1) = \rho(2, 1)^2$$

$$R(1, 0) = \rho(1, 0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said thin film.

9. The thin film thickness measurement apparatus according to claim 7, wherein said calculation unit calculates thickness of said thin film by equations of:

$$R(p+1, 0) = \frac{A + B}{1 + C + B}$$

$$A = R(p+1, p)+R(p, 0) \times k^2$$

$$B = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k \times \cos(\gamma(p, 0) + \gamma(p))$$

$$C = R(p+1, p) \times R(p, 0) \times k^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)} \times (1-\rho(p, p-1)^2) \times \sin(\gamma(p-1, 0)+\gamma(p-1))$$

$$E = \rho(p, p-1) \times (1+R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0) \times (1+\rho(p, p-1)^2) \times \cos(\gamma(p-1, 0)+\gamma(p-1))}$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p) / \lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of the p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said p-th layer of thin film.

10. The thin film thickness measurement apparatus according to claim 1, said analyze unit including

a spectroscope dividing reflected light from said substrate according to intensity of each wavelength, and

a calculation unit calculating thickness of a thin film of said substrate according to intensity of each wavelength divided by said spectroscope.

11. The thin film thickness measurement apparatus according to claim 10, wherein said calculation unit calculates thickness of said thin film by equations of :

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2, 1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1, 0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2, 1) = \rho(2, 1)^2$$

$$R(1, 0) = \rho(1, 0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said thin film.

12. The thin film thickness measurement apparatus according to claim 11, wherein said light receiving unit directs light substantially perpendicular to a substrate placed on a robot hand.

13. The thin film thickness measurement apparatus according to claim 11, wherein said light receiving unit is installed in a neighborhood of an outlet of a gate valve of a film growth apparatus.

14. The thin film thickness measurement apparatus according to claim 10, wherein said calculation unit calculates thickness of said thin film by equations of:

$$R(p+1, 0) = \frac{A + B}{1 + C + B}$$

$$A = R(p+1, p) + R(p, 0) \times k^2$$

$$B = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k \times \cos(\gamma(p, 0) + \gamma(p))$$

$$C = R(p+1, p) \times R(p, 0) \times k^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)} \times (1 - \rho(p, p-1)^2) \times \sin(\gamma(p-1, 0) + \gamma(p-1))$$

$$E = \rho(p, p-1) \times (1 + R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0) \times (1 + \rho(p, p-1)^2) \times \cos(\gamma(p-1, 0) + \gamma(p-1))}$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p) / \lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of the p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k is an absorption coefficient of said p-th layer of thin film.

15. The thin film thickness measurement apparatus according to claim 14, wherein said light receiving unit directs light substantially perpendicular to a substrate placed on a robot hand.

16. The thin film thickness measurement apparatus according to claim 14, wherein said light receiving unit is installed in a neighborhood of an outlet of a gate valve of a film growth apparatus.

17. The thin film thickness measurement apparatus according to claim 1, wherein said light receiving unit directs lights substantially perpendicular to a substrate placed on a robot hand.

18. The thin film thickness measurement apparatus according to claim 1, wherein said light receiving unit is installed in a neighborhood of an outlet of a gate valve of a film growth apparatus.

19. A thin film thickness measurement method comprising the steps of:

directing light substantially perpendicular to a substrate, and receiving light reflected from said substrate; and

analyzing thickness of a thin film of said substrate according to intensity of said received reflected light.

20. The thin film thickness measurement method according to claim 19, wherein said step of measuring thickness of said thin film includes the steps of

dividing reflected light from said substrate according to intensity of each wavelength, and

calculating thickness of a thin film of said substrate according to said intensity of each wavelength divided.

21. A thin film thickness measurement apparatus comprising:

a light source having a wavelength range of at least approximately 220 nm to 850 nm;

a projection unit guiding light from said light source and directing the light to a thin film formed on a substrate;

a light receiving unit receiving light reflected from said thin film or said substrate;

a spectroscope dispersing said reflected light received at said light receiving unit for each wavelength; and

a calculation unit calculating thickness of said thin film according to intensity of said reflected light in a wavelength range of approximately 220 nm to 850 nm dispersed by said spectroscope.

22. The thin film thickness measurement apparatus according to

claim 21, said projection unit including an optical fiber guiding light from said light source and directing light to a thin film formed on said substrate,

said light receiving unit including an optical fiber receiving said reflected light from said substrate and guiding said received reflected light to said spectroscope.

23. The thin film thickness measurement apparatus according to claim 21, wherein said light source comprises a plurality of lamps provided in the same casing and of a different wavelength range.

24. The thin film thickness measurement apparatus according to claim 23, wherein said plurality of lamps include a deuterium lamp and a halogen lamp.

25. The thin film thickness measurement apparatus according to claim 23, wherein said plurality of lamps can be turned on independently.

26. The thin film thickness measurement apparatus according to claim 23, wherein said calculation unit calculates thickness d of said thin film by equations of:

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2,1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1,0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2,1) = \rho(2,1)^2$$

$$R(1,0) = \rho(1,0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, k is an absorption coefficient of said thin film, and R is light reflectance intensity at said light wavelength λ, according to intensity of said reflected light dispersed by said spectroscope.

27. The thin film thickness measurement apparatus according to claim 23, wherein said calculation unit calculates thickness d(p) of the p-th layer of thin film from said substrate by equations of:

$$R(p+1, 0) = \frac{G+H}{1+J+H}$$

$$G = R(p+1, p) + R(p, 0) \times k(p)^2$$

$$H = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k(p) \times \cos(\gamma(p, 0) + \gamma(p))$$

$$J = R(p+1, p) \times R(p, 0) \times k(p)^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)} \times (1 - \rho(p, p-1)^2) \times \sin(\gamma(p-1, 0) + \gamma(p-1))$$

$$E = \rho(p, p-1) \times (1 + R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0) \times (1 + \rho(p, p-1)^2) \times \cos(\gamma(p-1, 0) + \gamma(p-1))}$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p)/\lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of said p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k(p) is an absorption coefficient of said p-th layer of thin film, according to intensity of said reflected light dispersed by said spectroscope.

28. The thin film thickness measurement apparatus according to claim 21, wherein said light source includes a plurality of lamps of different wavelength ranges, provided respectively in different casings.

29. The thin film thickness measurement apparatus according to claim 28, wherein said plurality of lamps include a deuterium lamp and a halogen lamp.

30. The thin film thickness measurement apparatus according to claim 28, wherein said plurality of lamps can be turned on independently.

31. The thin film thickness measurement apparatus according to claim 28, wherein said calculation ~~unit~~ calculates thickness d of said thin film by equations of:

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2,1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1,0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2,1) = \rho(2,1)^2$$

$$R(1, 0) = \rho(1, 0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, k is an absorption coefficient of said thin film, and R is light reflectance intensity of said light wavelength λ, according to intensity of said reflected light dispersed by said spectroscope.

32. The thin film thickness measurement apparatus according to claim 28, wherein said calculation unit calculates film thickness d(p) of the p-th layer of thin film from said substrate by equations of:

$$R(p+1, 0) = \frac{G+H}{1+J+H}$$

$$G = R(p+1, p)+R(p, 0)\times k(p)^2$$

$$H = 2\times\rho(p+1, p)\times\sqrt{R(p, 0)}\times k(p)\times\cos(\gamma(p, 0)+\gamma(p))$$

$$J = R(p+1, p)\times R(p, 0)\times k(p)^2$$

$$\rho(p+1, p) = \frac{n(p)-n(p+1)}{n(p)+n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)}\times(1-\rho(p, p-1)^2)\times\sin(\gamma(p-1, 0)+\gamma(p-1))$$

$$E = \rho(p, p-1)\times(1+R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0)\times(1+\rho(p, p-1)^2)\times\cos(\gamma(p-1, 0)+\gamma(p-1))}$$

$$\gamma(p) = 4\pi n(p)d(p)\cos\theta(p)/\lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of said p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k(p) is an absorption coefficient of said p-th layer of thin film, according to intensity of said reflected light dispersed by said spectroscope.

33. The thin film thickness measurement apparatus according to claim 21, wherein said light source includes a halogen lamp having a wavelength range of at least approximately 400 nm to 850 nm,

wherein said calculation unit calculates thickness of a thin film of said substrate according to intensity of said reflected light in the wavelength range of approximately 400 nm to 850 nm dispersed by said spectroscope.

34. The thin film thickness measurement apparatus according to claim 33, wherein said calculation unit calculates thickness d of said thin film according to equations of:

$$R = \frac{R(2,1) + R(1,0)\times k^2 + 2\times\rho(2,1)\times\rho(1,0)\times k\times\cos(\gamma)}{1 + R(2,1) + R(1,0)\times k^2 + 2\times\rho(2,1)\times\rho(1,0)\times k\times\cos(\gamma)}$$

$$\rho(2,1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1,0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2,1) = \rho(2,1)^2$$

$$R(1,0) = \rho(1,0)^2$$

$$\gamma = 4\pi n_1 d/\lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, k is an absorption coefficient of said thin film, and R is reflectance intensity of light at said light wavelength λ, according to intensity of said reflected light dispersed by said spectroscope.

35. The thin film thickness measurement apparatus according to claim 33, wherein said calculation unit calculates thickness d(p) of the p-th layer of thin film from said substrate by equations of:

$$R(p+1, 0) = \frac{G+H}{1+J+H}$$

$$G = R(p+1, p) + R(p, 0) \times k(p)^2$$

$$H = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k(p) \times \cos(\gamma(p, 0) + \gamma(p))$$

$$J = R(p+1, p) \times R(p, 0) \times k(p)^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E+F}$$

$$D = \sqrt{R(p-1, 0)} \times (1 - \rho(p, p-1)^2) \times \sin(\gamma(p-1, 0) + \gamma(p-1))$$

$$E = \rho(p, p-1) \times (1 + R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0)} \times (1 + \rho(p, p-1)^2) \times \cos(\gamma(p-1, 0) + \gamma(p-1))$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p) / \lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of said p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k(p) is an absorption coefficient of said p-th layer of thin film, according to intensity of said reflected light dispersed by said spectroscope.

36. The thin film thickness measurement apparatus according to claim 21, wherein said projection unit is arranged at a position directing light substantially perpendicular to said substrate,

wherein said light receiving unit is arranged at a position receiving light reflected substantially perpendicular from said substrate.

37. The thin film thickness measurement apparatus according to claim 36, wherein said projection unit includes one optical fiber guiding light from said light source and directing light substantially perpendicular to a thin film formed on said substrate,

wherein said light receiving unit includes a plurality of optical fibers respectively arranged around said one optical fiber, and respectively receiving light reflected from said substrate.

38. The thin film thickness measurement apparatus according to claim 37, wherein said one optical fiber and said plurality of optical fibers are cylindrical optical fibers having the same diameter,

wherein said plurality of optical fibers include six optical fibers.

39. The thin film thickness measurement apparatus according to claim 36, wherein said light receiving unit includes one optical fiber arranged at a position receiving light reflected substantially perpendicular from said substrate, and

wherein said projection unit includes a plurality of optical fibers respectively arranged around said one optical fiber to guide light from said light source and respectively directing light substantially perpendicular to a thin film formed on said substrate.

40. The thin film thickness measurement apparatus according to claim 39, wherein said one optical fiber and said plurality of optical fibers are cylindrical optical fibers having the same diameter,

wherein said plurality of optical fibers include six optical fibers.

41. The thin film thickness measurement apparatus according to claim 21, wherein said calculation unit calculates thickness d of said thin film by equations of:

$$R = \frac{R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}{1 + R(2,1) + R(1,0) \times k^2 + 2 \times \rho(2,1) \times \rho(1,0) \times k \times \cos(\gamma)}$$

$$\rho(2,1) = \frac{n_1 - n_2}{n_1 + n_2}$$

$$\rho(1,0) = \frac{n_0 - n_1}{n_0 + n_1}$$

$$R(2,1) = \rho(2,1)^2$$

$$R(1,0) = \rho(1,0)^2$$

$$\gamma = 4\pi n_1 d / \lambda$$

where n_0 is a refractive index of said substrate, n_1 is a refractive index of said thin film, n_2 is a refractive index of air, λ is a wavelength of light, k is an absorption coefficient of said thin film, and R is reflectance intensity of light at said light wavelength λ, according to intensity of said reflected light dispersed by said spectroscope.

42. The thin film thickness measurement apparatus according to claim 21, wherein said calculation unit calculates thickness d(p) of the p-th layer of thin film from said substrate by equations of:

$$R(p+1, 0) = \frac{G + H}{1 + J + H}$$

$$G = R(p+1, p) + R(p, 0) \times k(p)^2$$

$$H = 2 \times \rho(p+1, p) \times \sqrt{R(p, 0)} \times k(p) \times \cos(\gamma(p, 0) + \gamma(p))$$

$$J = R(p+1, p) \times R(p, 0) \times k(p)^2$$

$$\rho(p+1, p) = \frac{n(p) - n(p+1)}{n(p) + n(p+1)}$$

$$R(p+1, p) = \rho(p+1, p)^2$$

$$\tan\gamma(p, 0) = \frac{D}{E + F}$$

$$D = \sqrt{R(p-1, 0)} \times (1 - \rho(p, p-1)^2) \times \sin(\gamma(p-1, 0) + \gamma(p-1))$$

$$E = \rho(p, p-1) \times (1 + R(p-1, 0))$$

$$F = \sqrt{R(p-1, 0)} \times (1 + \rho(p, p-1)^2) \times \cos(\gamma(p-1, 0) + \gamma(p-1))$$

$$\gamma(p) = 4\pi n(p) d(p) \cos\theta(p) / \lambda$$

where n_0 is a refractive index of said substrate, n(p) is a refractive index of said p-th layer of thin film from said substrate, n(p+1) is a refractive index of air, λ is a wavelength of light, and k(p) is an absorption coefficient of said p-th layer of thin film, according to intensity of said reflected light dispersed by said spectroscope.

43. The thin film thickness measurement apparatus according to claim 21, wherein said thin film comprises a transparent conductive film, said substrate having a coat of a reflective film.

44. The thin film thickness measurement apparatus according to

claim 43, wherein said reflective film has an area larger than 0% and not more than 50% the area of a region subjected to film thickness measurement,

wherein said calculation unit calculates thickness of said thin film ignoring reflectance at said reflective film.

45. The thin film thickness measurement apparatus according to claim 43, wherein said reflective film has an area 50-100% the area of a region subjected to film thickness measurement,

wherein said calculation unit measures thickness of said thin film ignoring influence of light transmitted to an underlying thin film.

46. The thin film thickness measurement apparatus according to claim 43, wherein said reflective film is a metal film or an alloy film with tantalum, titanium, aluminum, chromium or molybdenum as a main component.

47. An electronic component fabrication apparatus comprising:

a film growth apparatus; and

a thin film thickness measurement apparatus including

a light source,

a projection unit guiding light from said light source and directing light substantially perpendicular to a thin film formed on a substrate,

a light receiving unit receiving light reflected from said thin film or said substrate,

a spectroscope dispersing reflected light received at said light receiving unit according to each wavelength, and

a calculation unit calculating thickness of said thin film according to intensity of said reflected light dispersed by said spectroscope,

said thin film thickness measurement apparatus provided in a fabrication line of electronic components and at a position carrying out thickness measurement of said thin film immediately after film growth by

said film growth apparatus.

48. The electronic component fabrication apparatus according to claim 47, wherein said projection unit includes a plurality of projection units directing light guided from said light source simultaneously to a plurality of sites on said substrate,

wherein said light receiving unit includes the plurality of light receiving units receiving light reflected at said plurality of sites.

49. The electronic component fabrication apparatus according to claim 48, said thin film thickness measurement apparatus further including

a plurality of first connectors attached respectively at a leading end of said plurality of light receiving units, and

a second connector having one end connected to said spectroscope, and the other end connected to any of said plurality of first connectors to guide light from the connected first connector to said spectroscope.

50. The electronic component fabrication apparatus according to claim 49, wherein each of said plurality of first connectors and said second connector has a collective lens incorporated respectively.

51. The electronic component fabrication apparatus according to claim 47, said thin film thickness measurement apparatus further including

a reflectance calibration projection unit guiding light from said light source and directing light substantially perpendicular to reflective material of light,

a reflectance calibration light receiving unit receiving light reflected from said reflective material, and

a reflectance calibration unit calibrating a parameter used in calculation of thickness of said thin film by said calculation unit according to light received by said reflectance calibration light receiving unit.

52. The electronic component fabrication apparatus according to claim 51, said thin film thickness measurement apparatus further including

a light source calibration projection unit guiding light from said light source and directing light to reflective material of light,

a light source calibration light receiving unit receiving light reflected from said reflective material, and

a light source amount reduction detection unit detecting reduction of an amount of light of said light source according to light received by said light source calibration light receiving unit.

53. The electronic component fabrication apparatus according to claim 52, said thin film thickness measurement apparatus further including

a disturbance light receiving unit receiving disturbance light, and

a disturbance light calibration unit calibrating a parameter used in calculating thickness of said thin film by said calculation unit according to light received by said disturbance light receiving unit.

54. The electronic component fabrication apparatus according to claim 47, said thin film thickness measurement apparatus further including

a light source calibration projection unit guiding light from said light source and directing light to reflective material of light,

a light source calibration light receiving unit receiving light reflected from said reflective material, and

a light source amount reduction detection unit detecting reduction of an amount of light of said light source according to light received at said light source calibration light receiving unit.

55. The electronic component fabrication apparatus according to claim 54, said thin film thickness measurement apparatus further including

a disturbance light receiving unit receiving disturbance light, and

a disturbance light calibration unit calibrating a parameter used in calculating thickness of said thin film by said calculation unit according to light received at said disturbance light receiving unit.

56. The electronic component fabrication apparatus according to claim 47, said thin film thickness measurement apparatus further including

a disturbance light receiving unit receiving disturbance light, and

a disturbance light calibration unit calibrating a parameter used in calculating thickness of said thin film by said calculation unit according to light received at said disturbance light receiving unit.

57. The electronic component fabrication apparatus according to claim 47, wherein said projection unit includes an optical fiber guiding light from said light source and directing light to a thin film formed on said substrate,

wherein said light receiving unit includes an optical fiber receiving reflected light from said substrate and guiding said received-reflected light to said spectroscope.

58. An electronic component fabrication method comprising the steps of:

growing a thin film on a substrate;

directing light substantially perpendicular to said thin film formed on said substrate immediately after film growth;

receiving light reflected from said thin film or said substrate;

dispersing said reflected light according to each wavelength; and

calculating thickness of said thin film according to intensity of said reflected light dispersed.

59. The electronic component fabrication method according to claim 58, wherein said step of directing light includes the step of directing light

substantially perpendicular to said substrate simultaneously onto a plurality of sites on said substrate immediately after film growth,

wherein said step of receiving reflected light includes the step of receiving plurality of light reflected from said thin film or said substrate.